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Participant Handbook

Sector
Agriculture and Allied

Sub-Sector
Poultry

Occupation
Poultry Hatchery Operation

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NSQF Level 5



**Hatchery
Incharge – Poultry**

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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



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AGRICULTURE SKILL COUNCIL OF INDIA

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

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It is expected that this publication would meet the complete requirements of QP/NOS based training delivery, we welcome the suggestions from users, Industry experts and other stakeholders for any improvement in future.

About this book

Hatchery Incharge – Poultry, also known as Hatchery Supervisor is responsible for overseeing various activities involved in incubation practice as per Qualification Pack (QP). Hatchery Incharge – Poultry is responsible for installation, testing, and commissioning of the individual at work to receive and grade eggs, manage incubation practice, grade and pack chicks, estimates and organizes required resources, maintain equipments; building and environment for hatching chicks according to market's standards. The job requires the individual to have good eyesight and observation ability, attention to details, ability to work independently, goal orientation, health safety and hazards orientation, willingness to wear protective gears and the stamina for long hours of work.

This handbook will help the participant to pass through following criteria for appropriate knowledge and skill development:

- **Knowledge and Understanding:** Adequate operational knowledge and understanding to perform the required task
- **Performance Criteria:** Gain the required skills through hands on training and perform the required operations within the specified standards
- **Professional Skills:** Ability to make operational decisions pertaining to the area of work.

The handbook incorporates well-defined roles for Installation, Testing, and Commissioning of Hatchery Incharge – Poultry. The participant handbook will enable participant to demonstrate skills of using various tools and decision making for instant problem solving.

Symbols Used



Key Learning Outcomes



Steps



Time



Tips



Notes



Unit Objectives



Exercise

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1. Introduction

Unit 1.1 - Hatcheries in India and its Scope



Key Learning Outcomes

At the end of this module, you will be able to:

- Understand the Hatchery and its scope in India

UNIT 1.1: Hatcheries in India and its Scope

Unit Objectives

At the end of this unit, you will be able to:

- Understand about the basic concepts of Hatcheries
- Understand role and responsibilities of Hatchery Incharge

1.1.1 Introduction

A hatchery is a facility where eggs are hatched under artificial conditions, especially those of fish or poultry. It may be used for Ex-situ Conservation purposes, i.e. to breed rare or endangered species under controlled conditions; alternatively, it may be for economic reasons (i.e. to enhance food supplies or fishery resources).

Poultry Hatcheries

Poultry hatcheries produce a majority of the birds consumed in the developed world including chickens, turkeys, ducks, geese, and some other minor bird species. A few poultry hatcheries specialize in producing birds for sale to backyard poultry keepers, hobby farmers, and people who are interested in competing with their birds at poultry shows. These hatcheries produce chicks of several different breeds and varieties, often including some heritage or endangered breeds.

Larger poultry hatcheries are related to industrial poultry meat or egg production. This is a multibillion dollar industry, with highly regimented production systems used to maximize bird size or egg production versus feed consumed. Generally large numbers are produced at one time so the resulting birds are uniform in size and can be harvested (for meat) or brought into production (for eggs) at the same time. A large hatchery produces 15 million chicks annually.

Poultry generally start with naturally (most species) or artificially (turkeys and Cornish-related chicken breeds) inseminated hens that lay eggs; the eggs are cleaned and shells are checked for soundness before being put into the incubators. Incubators control temperature and humidity, and turn the eggs until just before they hatch. Three days before the eggs are scheduled to hatch, they are moved into a hatchery unit, where they are no longer turned so the embryos have time to get properly oriented for their exit from the shell, and the temperature and humidity are optimum for hatching. Once the eggs hatch and the chicks are a few days old, they are often vaccinated.

1.1.2 Incubation and Hatching

Incubation is the act Forced draft incubators.

I. Based on heating source:

- Hot air incubator
- Hot water incubator

II. Based on fuel used

- Gas operated incubator
- Oil operated incubator

Five major functions are involved in the incubation and hatching of poultry eggs. They are:

- Temperature
- Humidity
- Ventilation (Oxygen and Carbon dioxide level and air velocity)
- Position of eggs
- Turning of eggs

Hatchery Operations:

The operation of a chick hatchery involves the production of the largest number of quality chicks possible from the hatching eggs received at the hatchery. In addition, chicks must be produced economically.

Role and Responsibilities of a Hatchery Incharge:

- Supervises and coordinates activities of workers engaged in receiving and preparing eggs for incubation; incubating eggs; grading, preparing, and shipping chicks in poultry hatchery
- Assigns workers to duties, such as egg candling, sorting and trayng, incubating eggs, and grading and debeaking chicks.
- Monitors thermometers, gauges, and chart recorders to detect equipment malfunctions and to verify compliance with incubator temperature and ventilation standards.
- Adjusts controls to maintain specified incubating conditions.
- Periodically inspects eggs in incubator trays to ascertain hatching progress, and orders removal of chicks.
- Prepares production reports, and requisitions equipment, materials, and supplies

Notes





2. Receive and Store Eggs

Unit 2.1 - Norms for collection and selection of quality hatching eggs

Unit 2.2 - Storage specifications for hatching eggs



Key Learning Outcomes

At the end of this module, you will be able to:

- Determine potential of breeder flock
- Examine housing and environment of breeder flock
- Plan nesting arrangements for breeder flock
- Examine hygienic handling of hatching eggs
- Plan selection and grading of hatching eggs

UNIT 2.1: Norms For Collection and Selection of Quality Hatching Eggs

Unit Objectives

At the end of this unit, you will be able to:

- Monitor quality and high grade hatching eggs

2.1.1 Norms For Collection and Selection of Quality Hatching Eggs

Healthy breeder flock

- The parent stock flock needs to be housed in well ventilated houses with correct indoor temperatures, litter in good condition (dry, not dusty, not crusty, without moulds), a well-adjusted lighting program, sufficient feeder and watering space per bird.
- Ventilation is the most efficient method to reduce the amount of microorganisms in the air, which may contaminate the hatching egg. A correct control of the fans-eliminates draught, maintains an ambient temperature and supplies sufficient fresh air in the house.
- At the onset of lay the depth of litter should not be too deep as this may result in many floor eggs.
- Instead of wood shavings coarse sand may be used.
- If drinkers stand or hang above the litter wet spots may be found, in which rotting bacteria may develop giving rise to the explorers.
- Concrete floors (asphalt) are essential for a good disinfection and the prevention of repeating worm infestations

Nesting arrangements

- With individual nest boxes, 1 nest per 5 hens should be provided
- Satisfactory layer of clean nesting material should be available
- The nests, if not automatic or semi-automatic, should have clean litter
- Add new litter if the layer of litter decreases or becomes dirty
- Keep hens from roosting in the nest at night and remove all broody hens quickly
-

Sex ratio

- As production starts, at least 8 males per 100 hens should be present.
- Ten males per 100 females represent the utmost limit. An excess as well as a shortage of males will cause fertility problems in the flock as well as reduction in hatchability performance

Cleanliness of eggs in breeder farm

- Cleanliness of egg is an important criteria for selecting the hatching eggs. Since it ultimately affects the hatchability performance also cause possibility of vertically transmitted disease occurrence.

Selection of good quality eggs for the hatchery should match the following criteria

- Clean egg shell (No manure, litter, feathers or blood)
- No cracks
- Well shaped
- No double yolk
- Weight range according to hatchery policy (usually 52 – 68 grams and some hatcheries go as low as 48 g)

Second graded egg which are rejected for hatching as follows:



Heavily soiled egg



Dirty egg



Bloody egg



Thin shelled egg



Misshapen egg



Too small and too big egg



Cracked egg



Ridged egg

Egg collection frequency

- Collect the eggs twice in the morning and once in the afternoon - to help decrease the number of dirty and broken eggs and start cooling eggs
- Collection should be more frequent in very hot or cold weather
- Eggs should be held at 60 degrees Fahrenheit and 70 percent relative humidity before cleaning

Conclusion

- Proper collection and selection of eggs for hatching handling ensures the delivery of good quality chicks for sales to consumers. the above information viable options for egg producers in executing proper handling within their own production system

Exercise



1. Enumerate important criteria in breeder flock management.

Answer:.....

2. Mention ideal sex ratio for better fertility.

Answer:.....

3. How many times eggs need to be collected.

Answer:.....

4. Explain how to clean the hatching eggs.

Answer:.....

5. Explain the scientific technique required for grading of eggs.

Answer:.....

UNIT 2.2: Storage Specifications For Hatching Eggs

Unit Objectives

At the end of this unit, you will be able to:

- Determine optimum environmental conditions and its management in egg storage chain

2.2.1 Storage Specifications For Hatching Eggs

Egg collection

- Eggs should be collected from the farms and transported to the hatchery at least twice a week
- Collected eggs should be stored at optimal condition till incubation

Egg storage areas

1. Farm egg room
2. Storage during transport
3. Hatchery egg room

Criteria for egg storage

- Temperature fluctuations must be avoided during transport and storage
- Temperature and humidity fluctuation may leads to condensation (“sweating”) on eggs or eggs being chilled or overheated
- The temperature decrease must be a smooth transition when cooling the eggs from the hen house to the hatchery egg room, and also a smooth transition when warming the eggs from the hatchery egg room to the setter machine

Optimum Egg Storage Conditions

- A relationship exists between the length of time eggs are stored and the optimum temperature and humidity for best hatchability. Generally, the longer eggs are to be stored, the lower the storage temperature and vice versa
- The optimum temperature for eggs which are stored during 3 to 4 days is probably 18°C
- For a period from 4 up to 7 days the optimum temperature should be 16°C
- If the storage is for more than 7 days the temperature needs to be 15-16°C
- Not advisable to store eggs more than 14 days

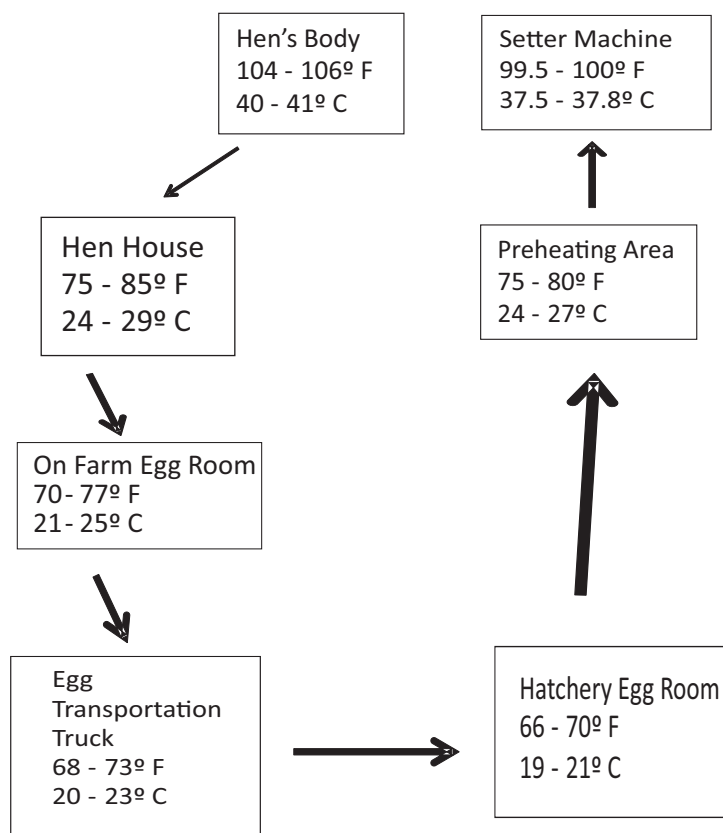
Storage of hatching eggs

- Two compartments - One compartment for cleaning and grading eggs and storage of packing material and other for storage of hatching eggs
- Needs to be fitted with a cooling and heating system and well insulated to maintain a constant temperature and humidity
- For each square meter one may store 22 boxes (each of 360 eggs = 7920 eggs)
- If possible, place the boxes on wood-slat platforms. Dust, draught and mice should not penetrate the egg storage room

Effects of storing eggs

- Storage prolongs incubation time. On average, one day's storage adds one hour to incubation time. This must be taken into account when eggs are set, so fresh and stored eggs should be set at different times
- Hatchability is depressed by prolonged storage. The effect increases with storage time after the initial six-day period, resulting in losses of 0.5 to 1.5% per day with the percent increasing as storage extends further
- Chick quality will be affected and hence weights can be depressed in chicks from eggs that have been stored for 14 days or more

Egg temperature flow chart



At least twice a week (better daily), the eggs need to be taken from the egg supply farms and transported to the hatchery if an egg storage room is not available on the farm

Tips

- Optimum temperature of 16-18°C is important in egg storage room
- Maximum egg storage time is 10 days
- Temperature fluctuation should be avoided
- Prolonged egg storage reduces hatchability

Exercise



1. List out major factors influencing the egg storage.

Answer:.....
.....

2. What is the temperature requirement in egg storage room?

Answer:.....
.....

3. What should be the maximum period of egg storage?

Answer:.....
.....

4. Specify the temperature requirement during transport.

Answer:.....
.....

5. Explain the effect of prolonged storage on hatchability.

Answer:.....
.....
.....

Notes